

Exciting Action of Acid and Alkali

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with that of the galvanometer, it is easy to ascertain the relation of one metal with two fluids., or of two metals with one fluid, or of two metals and two fluids upon each other.

673. Dilute sulphuric acid, sp. gr. 1.25, was put into the cell

A, and a strong solution of caustic potassa into the cell B;

they mingled slowly through the paper, and at last a thick crust

of sulphate of potassa formed on the side of the paper next to

the alkali. A plate of clean platina was put into each cell and

connected with a delicate galvanometer, but no electric current

could be observed. Hence the *contact* of acid with one platina

plate, and alkali with the other, was unable to produce a current;

nor was the combination of the acid with the alkali more

effectual (660).

674. When one of the platina plates was removed and a zinc

plate substituted, either amalgamated or not, a strong electric

current was produced. But, whether the zinc were in the acid

whilst the platina was in the alkali, or whether the reverse

order were chosen, the electric current was always from the

zinc through the electrolyte to the platina, and back through

the galvanometer to the zinc, the current seeming to be strongest

when the zinc was in the alkali and the platina in the acid.

675. In these experiments, therefore, the acid seems to have

no power over the alkali, but to be rather inferior to it in force.

Hence there is no reason to suppose that the combination of the

oxide formed with the acid around it has any direct influence

in producing the electricity evolved, the whole of which appears

to be due to the oxidation of the metal (654).

676. The alkali, in fact, is superior to the acid in bringing a

metal into what is called the positive state; for if plates of the

same metal, as zinc, tin, lead, or copper, be used both in the

acid or alkali, the electric current is from the alkali across the

ceji to the acid, and back through the galvanometer to the

alkali, as Sir Humphry Davy formerly stated.¹

This current is

so powerful, that if amalgamated zinc, or tin, or lead be used,

the metal in the acid evolves hydrogen the moment it is placed

in communication with that in the alkali, not from any direct

action of the acid upon % for if the contact be broken the action

ceases, but because it is powerfully negative with

regard to the
metal in the alkali.
677. The superiority of alkali is further proved
by this, that
if zinc and tin be used, or tin and lead,
whichsoever metal is

¹ *Elements of Chemical Philosophy*, p. 149; or *Philosophical
Transactions*,
1826, p. 403.

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